

## Exercise 3.2

- Q1 If  $X$  and  $Y$  are mutually exclusive events, with  $P(X) = 0.48$  and  $P(Y) = 0.37$ , find:
- $P(X \text{ and } Y)$
  - $P(X \text{ or } Y)$
  - $P(X' \text{ and } Y')$
- Q2  $P(L) = 0.28$ ,  $P(M) = 0.42$  and  $P(N) = 0.33$ .  
If the pairs of events ( $L$  and  $M$ ) and ( $L$  and  $N$ ) are mutually exclusive, and  $P(M \text{ and } N) = 0.16$ , find:
- $P(L \text{ or } M)$
  - $P(L \text{ or } N)$
  - $P(M \text{ or } N)$
  - $P(L \text{ and } M \text{ and } N)$
  - Draw and label a Venn diagram to show events  $L$ ,  $M$  and  $N$ .
- Q3 Kwame is planning his evening. The probabilities that he will go bowling, to the cinema or out for dinner are 0.17, 0.43 and 0.22 respectively. Given that he only has time to do one activity, find:
- The probability that he either goes bowling or to the cinema.
  - The probability that he doesn't do any of the 3 activities.
- Q4 For events  $A$ ,  $B$  and  $C$ ,  $P(A) = 0.28$ ,  $P(B) = 0.66$ ,  $P(C) = 0.49$ ,  $P(A \text{ or } B) = 0.86$ ,  $P(A \text{ or } C) = 0.77$  and  $P(B \text{ or } C) = 0.92$ .  
Find each of the probabilities below and say whether or not each pair of events is mutually exclusive.
- $P(A \text{ and } B)$
  - $P(A \text{ and } C)$
  - $P(B \text{ and } C)$
- Q5 For events  $C$  and  $D$ ,  $P(C') = 0.6$ ,  $P(D) = 0.25$  and  $P(C \text{ and } D') = 0.4$ .
- Show that  $C$  and  $D$  are mutually exclusive.
  - Find  $P(C \text{ or } D)$
- Q6 A box contains 50 biscuits. Of the biscuits, 20 are chocolate-coated and the rest are plain. Half of all the biscuits are in wrappers. One biscuit is selected at random from the box.  
If  $P$  is the event 'the biscuit is plain', and  $W$  is the event 'the biscuit is in a wrapper', show that events  $P$  and  $W$  are not mutually exclusive.